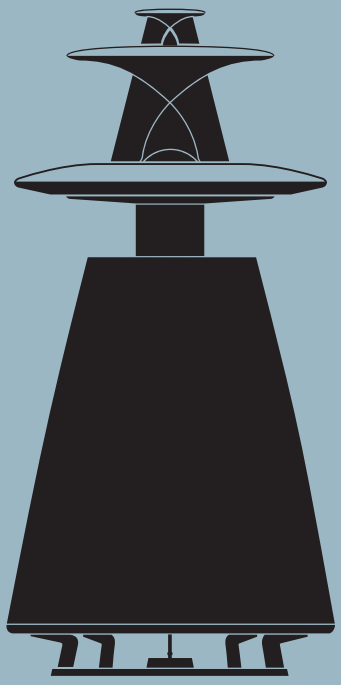
BeoLab 5

Type 6881, 6882, 6883, 6884, 6885, 6886, 6887, 6888
From serial no. 19375256

Service Center repair guide
English



BANG & OLUFSEN

How to service

Front line service

BeoLab 5 must be serviced in the customers home in terms of electrical symptoms or exhange of mechanical parts such as cloth frame, microphone or foot. In this way you avoid having to transport the heavy loudspeaker (967mm/Ø485mm,61kg) from and back to the customer. For front line service we offer a back-up suitcase. All needed electrical parts are found in the back-up suitcase (beside the transformer and lower woofer). Mechanical parts (cloth frame, foot, cabinet or alu. plates) must be ordered separately.

Service documentation

Service documentation for the BeoLab 5 will be a "Service Center repair guide" with part no. for the back-up suitcase, electrical and mechanical parts, User's guides etc.

Converting mains voltage supply

If it is necessary to change voltage supply, e.g. when moving between two countries, it is necessary to order new mains transformer and a jumper on the ICEsystem 1 PCB6 (J200 = 220-240Vac, J201 = 100-120Vac). For US/JPN the fuse F10/11 on the mains filter PCB1 must be changed from T5A to T10A also.

E.g.: Moving from EU (type 6881) to Japan (type 6884) with a pair of BeoLab 5, order two mains transformers for type 6884, and move the jumper on the ICEsystem 1 PCB6 from J200 to J201 to adapt both speakers to the 100Vac mains voltage.

Type survey

Variants	Type	Transformer	Jumper J200/J201 on PCB6	Mains cable	Fuse F10/11 on PCB1
EU	6881	8013627	J200 mount.	6100440	6600177 (T5A)
I	6888	8013627	J200 mount.	6100441	6600177 (T5A)
CH	6887	8013627	J200 mount.	6100442	6600177 (T5A)
GB	6882	8013627	J200 mount.	6100443	6600177 (T5A)
US	6883	8013629	J201 mount.	6100444	6600176 (T10A)
JPN	6884	8013628	J201 mount.	6100445	6600176 (T10A)
AUS	6885	8013630	J200 mount.	6100446	6600177 (T5A)
KOR	6886	8013627	J200 mount.	6100447	6600177 (T5A)

Warnings

ESD

STATIC ELECTRICITY
MAY DESTROY THE
PRODUCT

When electrical replacements or disassembly is taking place, use a ESD-mat.
The internal electronic are very sensitive to static electricity.

General warnings

Wear cutton cloves to avoid any fingerprints on the product.

The aluminium surfaces on the product is very sensitive, so handling should be done with great care to avoid damage.

The mechanical limit for the driver is easily reached when the vacuum tightness in BeoLab 5 is broken.

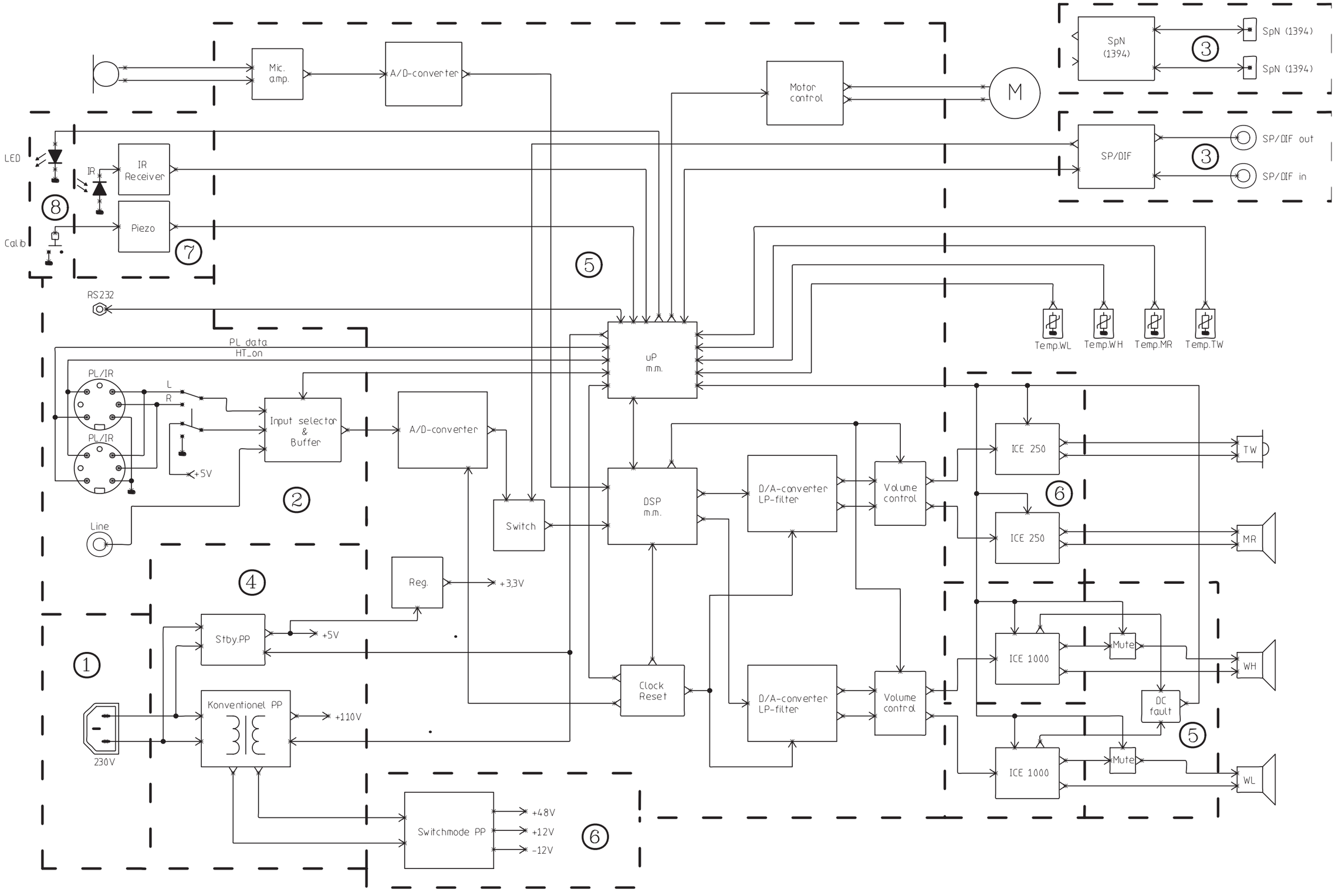
PIN code protection

The PIN code protection system will be introduced in autumn 2003.
This will be the known PIN code system, which are used in others products. The system will be mentioned in the user guide when introduced. Like on other products you will be able to use the service master code, when service is performed (11111).

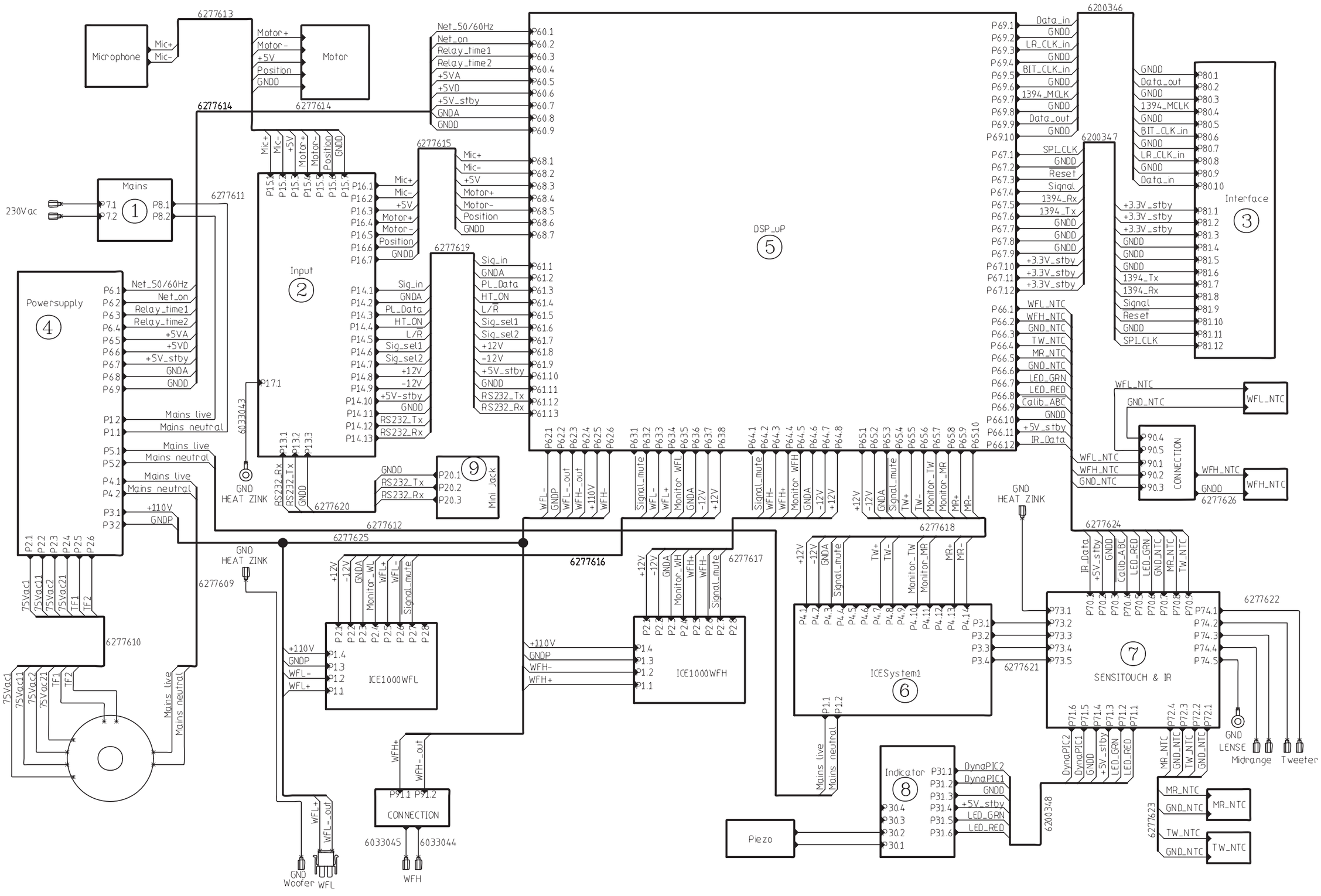
PIN code protection is introduced from serial number : _____

Specification guidelines for service use	BeoLab 5
Type no. 6881	Europe - 230V
Type no. 6882	England - 230V
Type no. 6883	USA, Canada - 120V
Type no. 6884	Japan - 100V
Type no. 6885	Australia - 240V
Type no. 6886	Korea- 220V
Type no. 6887	Switzerland - 230V
Type no. 6888	Italy - 230V
Dimensions	Height - 967mm
	Ø - 485mm
	Weight - 61kg
Box for one loudspeaker	Height - 1300mm
	Width - 600mm
	Length - 600mm
Cabinet finish	Aluminium and black cloth
Cabinet volume	Upper bass - 5 litres
	Lower bass - 29 litres
Power Consumption typical	15 W
	Stand-by >0.5 W
Maximum Sound Pressure Level	108 dB
Power amplifiers	4
Long term maximum, output power per amplifier	Lower bass : 1000 watts
	Upper bass : 1000 watts
	Midrange : 250 watts
	Tweeter : 250 watts
Effective Frequency Range	20 – 20,000 Hz
Crossover frequency	120/600/2000 Hz
Cabinet principle	Closed box
Magnetically shielded	No
Lower woofer	381mm - 15”
Upper woofer	165mm - 6.5”
Midrange	76mm - 3”
Tweeter	19mm - ¾”
Directivity control treble and midrange	*Acoustic Lens Technology
Bass equalisation	ABC (Adaptive Bass Control)
Connections	2×Powerlink
	Phono (Line)
	**2×Digital IEC 60958
Volume adjustment	Built-in
*ALT (or Acoustic Lens Technology) is licensed from Sausalito Works LLC.	
**32/44.1/48/88.2/96 K	
Subject to change without notice	

Overall block diagram

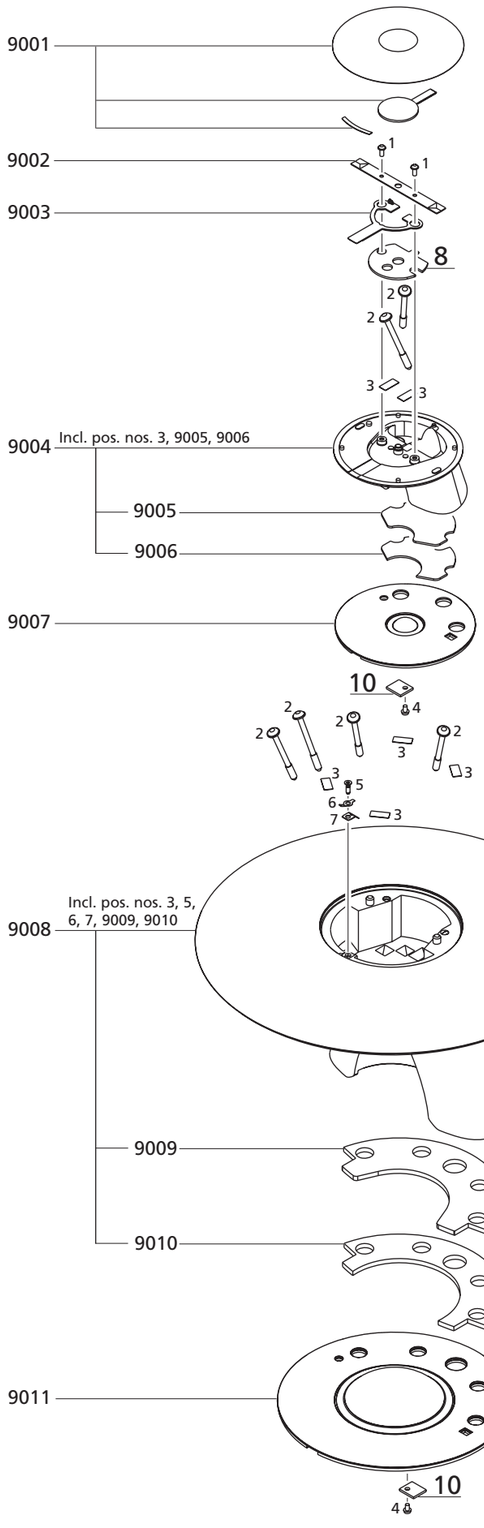


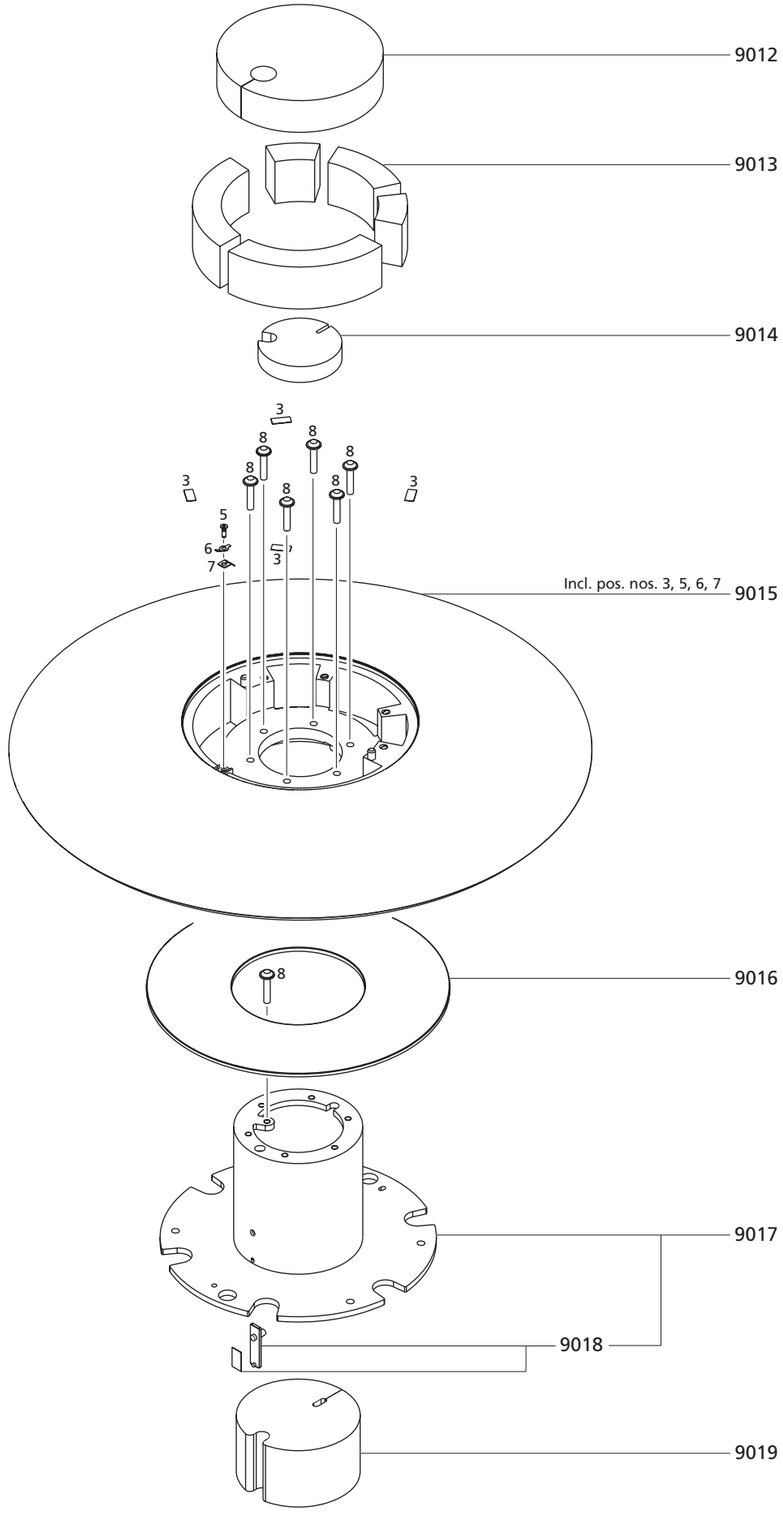
Wiring diagram



4.1 Available parts

Available parts
Lens





4.2 Available parts 4.2

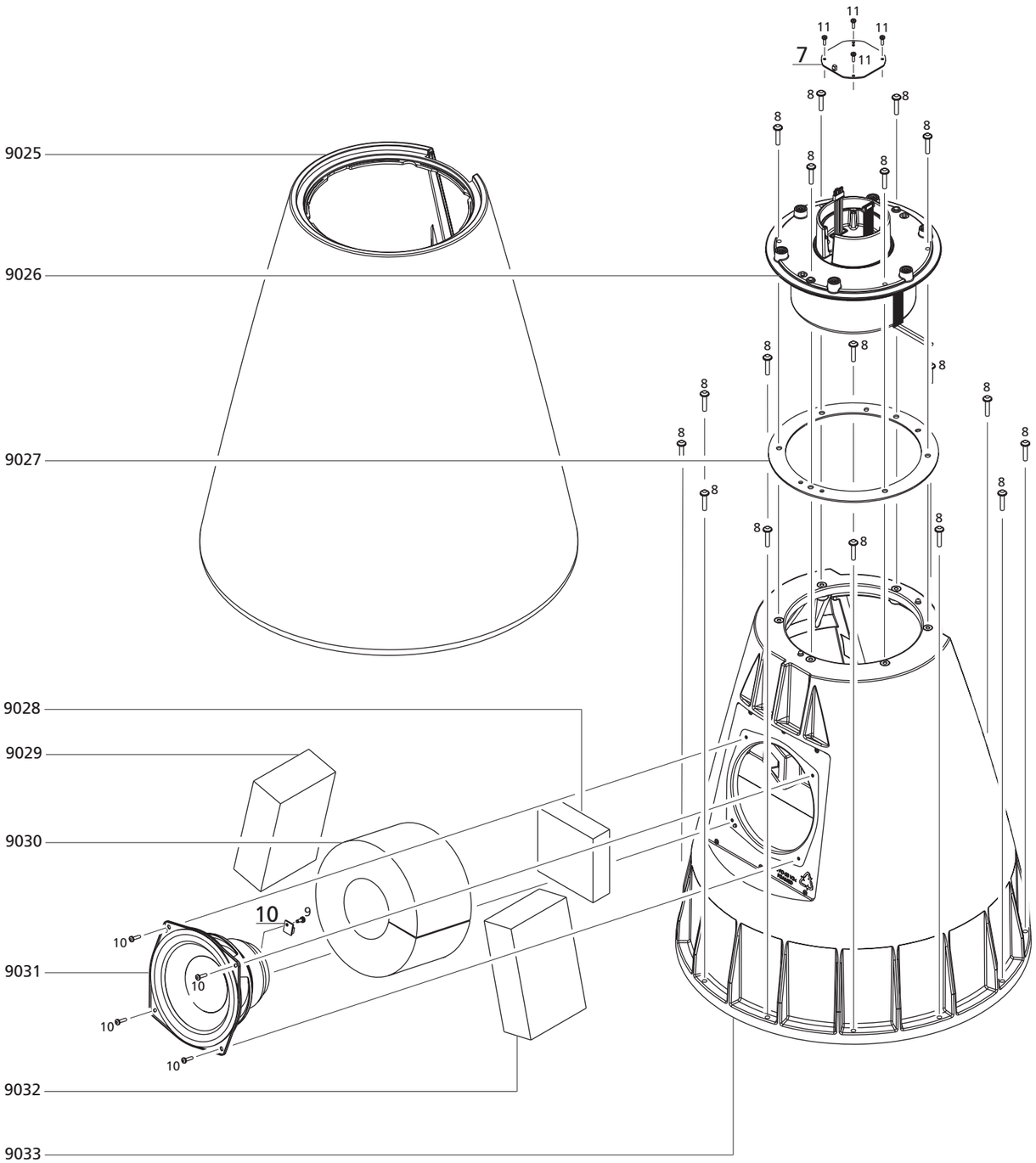
Lens

9001	3459436	Topplate, complete
9002	3460017	Holder
9003	6150038	Lens f/Indicator
9004	3452736	Lens f/TW incl. pos. nos. 3, 9005, 9006
9005	3947806	Felt f/TW, large
9006	3947807	Felt f/TW, small
9007	8480373	Tweeter - 19mm, 3/4"
9008	3452737	Aluminiumplate f/TW incl. pos. nos. 3, 5, 6, 7, 9009, 9010
9009	3947808	Felt f/MR, large
9010	3947809	Felt f/MR, small
9011	8480374	Midrange - 76mm, 3"
9012	3332096	Damping material
9013	3332098	Damping material, base
9014	3332101	Damping material, MR
9015	3452738	Aluminiumplate f/MR incl. pos. nos. 3, 5, 6, 7
9016	3459437	Topcover
9017	3452739	Tube w/flange incl. pos. no. 9018
9018	6150036	Lens f/IR
9019	3332099	Damping material
8Module	8100089	PCB8, Indicator
10Module	8100090	PCB10, NTC

Survey of screws etc.

1	2013263	Screw 3 x 7mm
2	2013257	Screw 5 x 50mm
3	3947350	Tape, roll 3 x 7mm
4	2038096	Screw 3 x 5mm
5	2013255	Screw 3 x 10mm
6	2816298	Ground spring
7	7530138	Plug
8	2058063	Screw 5 x 25mm

Speakers


9025
9026
9027
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9030
9031
9032
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7
10
999
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9035
9036
9037
9038
9039
9040
9041
9042
9043

Speakers

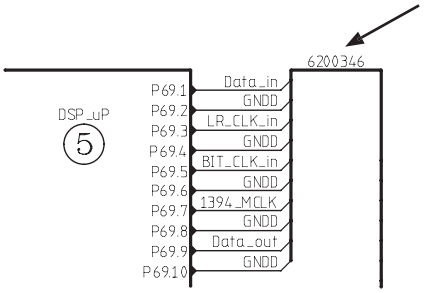
9025	3320719	Cloth frame
9026	8013627	Transformer, EU, KOR
	8013628	Transformer, JPN
	8013629	Transformer, US
	8013630	Transformer, AUS
9027	3340246	Gasket, set
9028	3332094	Damping material, back
9029	3332095	Damping material, side
9030	3332097	Damping material, ring
9031	8480376	Woofer - 165mm, 6½"
9032	3332095	Damping material, side
9033	3400303	Loudspeaker cabinet, incl. tape
9034	3160307	Cover f/plug connections
9035	3151722	Cover f/RS232 plug
9036	2816381	Hook f/cloth frame
9037	6100440	Mains cable, EU
	6100443	Mains cable, GB
	6100444	Mains cable, US
	6100445	Mains cable, JPN
	6100446	Mains cable, AUS
	6100447	Mains cable, KOR
	6100441	Mains cable, I
	6100442	Mains cable, CH
9038	3151552	Wire holder
9039	8480375	Woofer - 381mm, 15"
9040	3340246	Gasket, set
9041	8470042	Microphone unit
9042	2752098	Foot
9043	3103417	Foot, soft
7Module	8100091	PCB7, Sensitouch & IR
10Module	8100090	PCB10, NTC
999Module	8052224	Main chassis with PIN code protection
1F10/11	6600177	Fuse (T5A)
	6600176	Fuse (T10A)
6J200	6000096	Jumper
6J201	6000096	Jumper

Survey of screws

8	2058063	Screw 5 x 25mm
9	2056008	Screw 3.5 x 10mm
10	2015177	Screw 3.5 x 14mm
11	2054022	Screw 3 x 8mm
12	2042054	Screw 4 x 12mm
13	2015180	Screw 4 x 12mm
14	2015174	Screw 4 x 14mm
15	2038118	Screw 3 x 6mm
16	2072127	Center screw

Wire bundles

See wiring diagram page 3.2.
The part no. is printed on the diagram above the wire bundle, as shown.



Parts not shown

3395224 Back-up suitcase with PIN code protection

3375007 Product cover
3624521 Service bracket
3624161 Service holder f/topcover pos. no. 9016

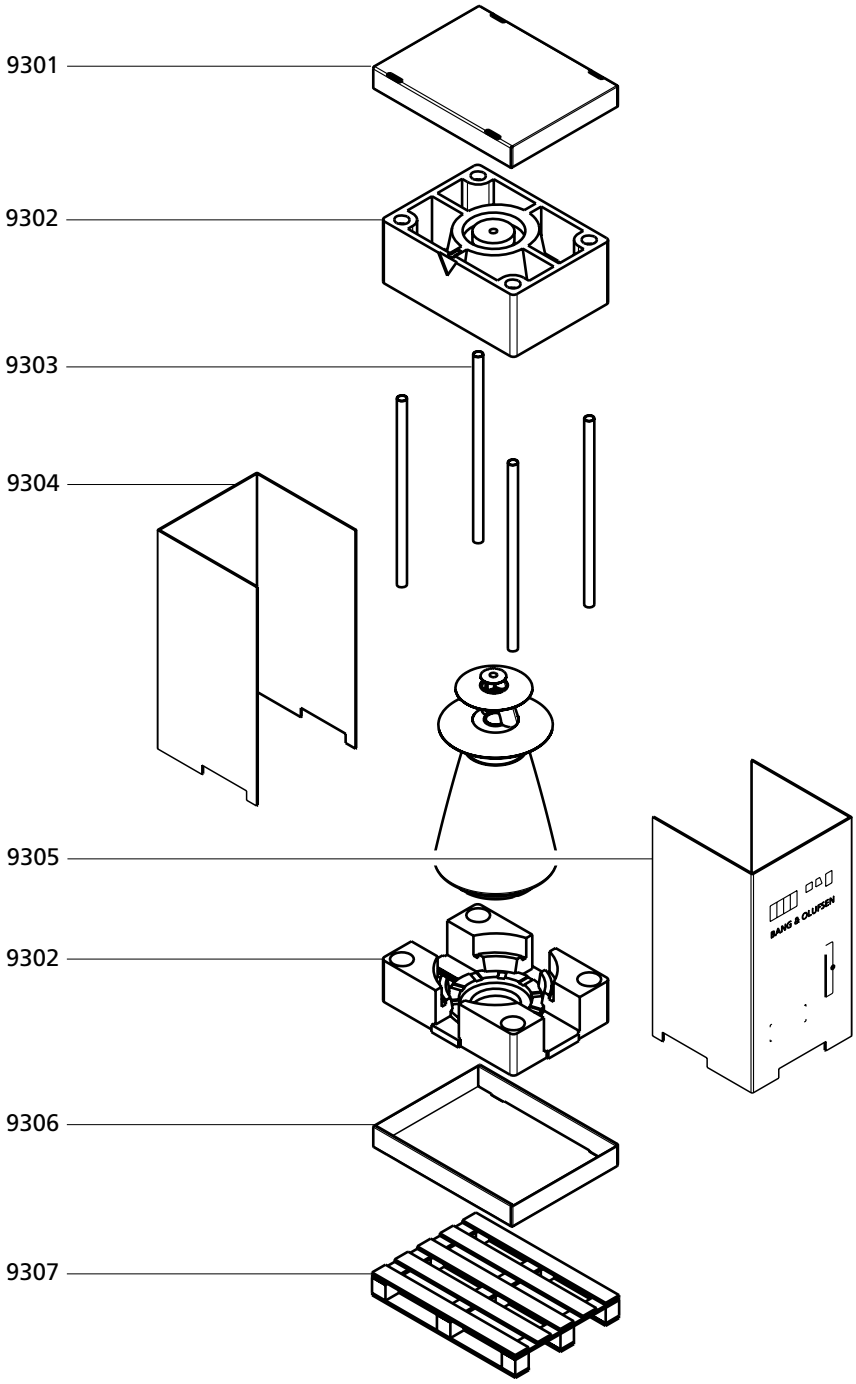
6270900 Dig. cable w/ferrite, black, 5m
6270775 Line cable, black, 5m
6270901 Sync. cable, 10m
6270688 Power Link cable, black, 5m

3629144 Special tool f/topcover
3040001 Torx key
3132288 Brush

3390586 Cable cover set

Guides, see Retail Ordering System

Packing



9301	3392766	Outer carton, top
9302	3396196	Foam packing, set of top and bottom
9303	3392074	Distance pipe - order 4pcs.
9304	3392772	Outer carton, side
9305	3392772	Outer carton, side
9306	3392766	Outer carton, bottom
9307	3392685	Wooden pallet, EU
	3392768	Wooden pallet, AUS
	3917105	Foam foil

The main chassis in the back-up suitcase, is setup as a EU version. If it should be used in a JPN or US product, it will need to be converted. See page 6.4.

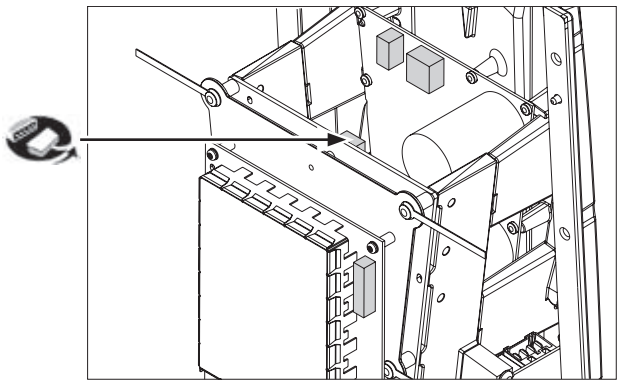
Service tips

Symptom:
The loudspeaker does not switch on, and the stand-by diode is always red.

Cause:
The amplifier is in protection-mode. The cause can be to high a load due to for instance a disconnected/broken loudspeaker unit or NTC-PCB. The cause can also be an internal fault in the main chassis.

Solution:
Check the load from the unit (b.m.o. an Ohm-meter) and replace the loudspeaker unit, NTC-PCB or main chassis by using the back-up suitcase which contains all necessary parts for On-site service. (Does not contain lower woofer or transformer).

Bring the main chassis into service position, and mount the complete lens again, this way you can check the connection all the way through the lens. When the chassis is in service position disconnect P3 on PCB6. On this plug you will be able to check the tweeter and midrange unit, with a digital multimeter.



Between red and orange there should be 5.7 ohm (midrange)
Between green and yellow there should be 3.0 ohm (tweeter)

The LB and UB can be measured directly on the units, after disconnecting the plugs.

The LB should measure 3.1 ohm
The UB should measure 5.0 ohm

All four NTC resistors should measure 470Kohm.

Note!

A thermal overload shuts down the BeoLab 5. Disconnect the mains for a few seconds to reset BeoLab 5.

Service tool

To service BeoLab 5 a LabTop with the Bang & Olufsen service tool application is needed. With the "Service Tool" it is possible to read error codes, service counters and product ID and to save them in a file. (The service tool is downloaded from the Retail System).
It is also possible to read data from the EEPROM and write data to the EEPROM. This is necessary when a driver unit or a EEPROM has to be replaced. Test functions and software update are also possible.

Replacement of driver

If it should be necessary to replace one of the driver units there are several things to be aware of. For service purposes each driver is measured separately and the result of this measurement is stored in a server at Bang & Olufsen together with a specific serial number for each driver.
A label is placed on the driver with its serial number. In BeoLab 5 the data belonging to drivers are stored in a EEPROM, placed in a socket on the chassis. In a repair situation it is necessary to be able to write the data - belonging to the actually driver to the EEPROM. This is done with a LapTop with the Bang & Olufsen Service Tool application.
All data for the drivers will be available in the Retail System.

The procedure:
Access the Retail System and download driver data for BeoLab 5. Data for all existing drivers will be downloaded to the LapTop. This is done to be sure that the technicians have access to the correct data.
When the technician has replaced a defective driver in BeoLab 5 he must check the serial number of the new driver - written on a label, placed on the driver.
Connect the cable between the LapTop and BeoLab 5 and start the Service Tool and access "BeoLab 5" in the menu.
Choose the function for writing to the EEPROM and key in the serial number. The application will automatically find the correct data for the actual driver. Press the button for write and the data will be transferred to BeoLab 5. An extra label with the serial number is supplied with the driver. This must be placed on the cabinet.

Replacement of EEPROM

If the EEPROM is defect the data for all the drivers must be written into a new EEPROM. The serial number for the drivers can be found on the drivers/cabinet. The serial number refers to the data for the actually driver.

Procedure:
When the defect EEPROM is replaced the data of the drivers must be written to the EEPROM via the service tool:

- Connect the cable between the LapTop and BeoLab 5 and start the Service Tool and access "BeoLab 5" in the menu. Choose the function for writing to the EEPROM and key in the serial numbers written on the labels. The application will automatically find the correct data for the actual drivers. Press the button for write and the data will be transferred to BeoLab 5.

ABC calibration after repair:
When the EEPROM has been changed the actual ABC filtres are lost. This means that it is necessary to let BeoLab 5 carry out the ABC calibration.

Replacement of the chassis

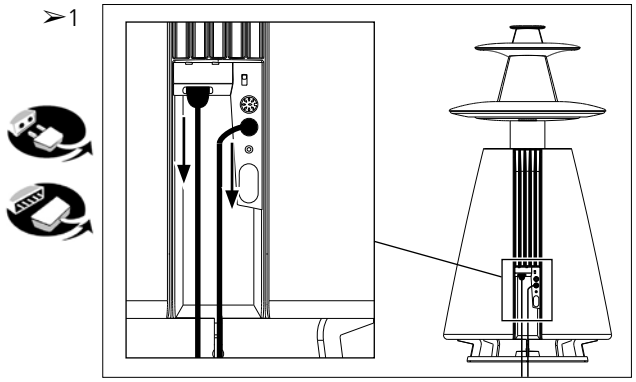
If the electronic chassis has a defect the complete chassis - except the EEPROM - must be replaced. The EEPROM contains driver data and must be moved from the defect chassis to the new one. If it is necessary to replace the EEPROM - for instance because of lightning - the driver data must be read in.

Cleaning

Clean the loudspeaker surfaces using a lint-free cloth which you have wrung firmly in lukewarm water. Never use a vacuum cleaner to clean the two domes. However, the front speaker cloth may be cleaned with a vacuum cleaner with a brush nozzle, and set to the lowest suction level.
Never use alcohol or other solvents to clean any parts of the loudspeaker.

Replace cloth frame

➢1



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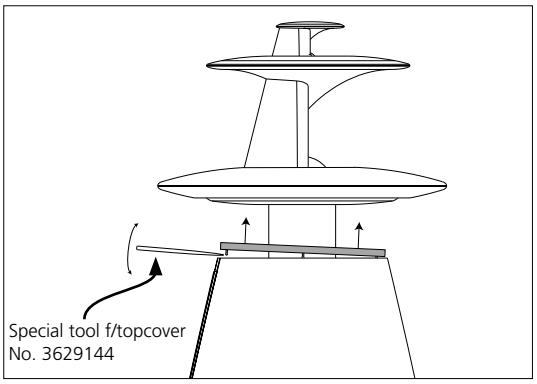

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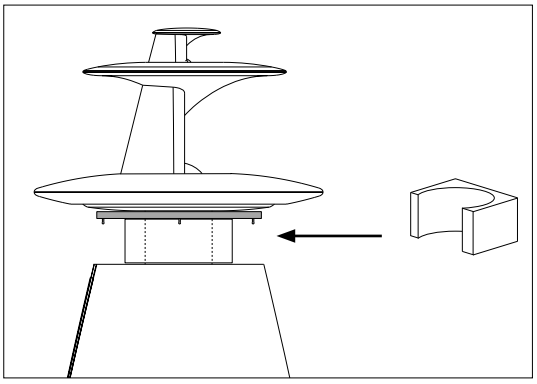

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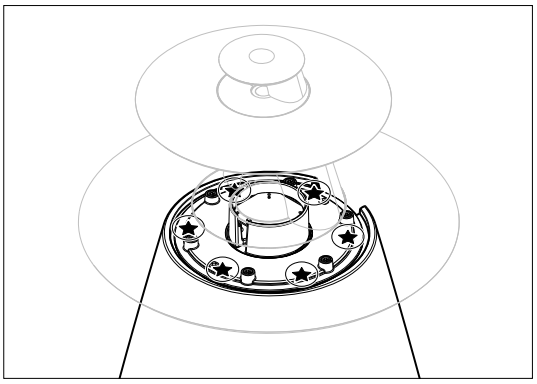

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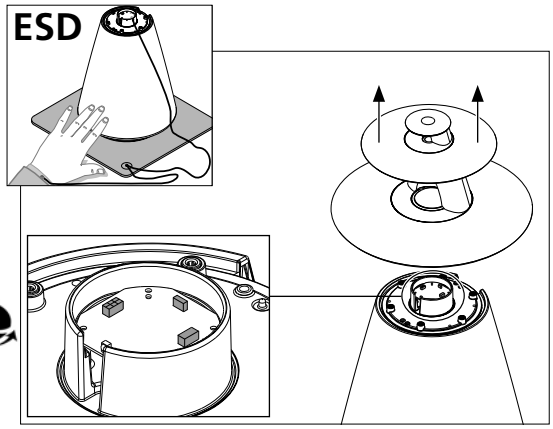

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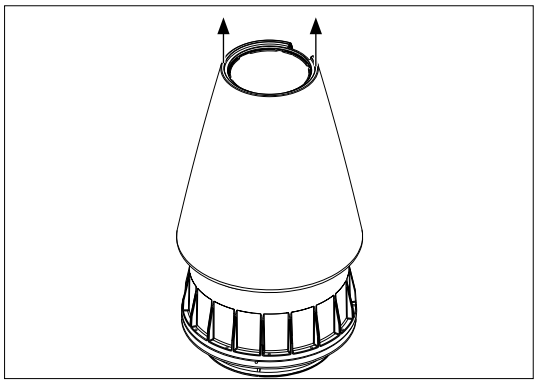
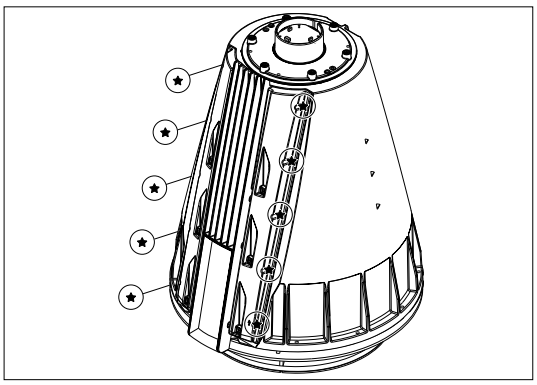


BeoLab 5 in service position

See page 6.1, Remove cloth frame

➢1

10x
TX20



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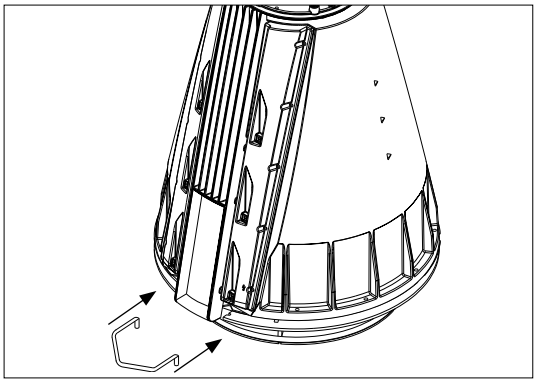

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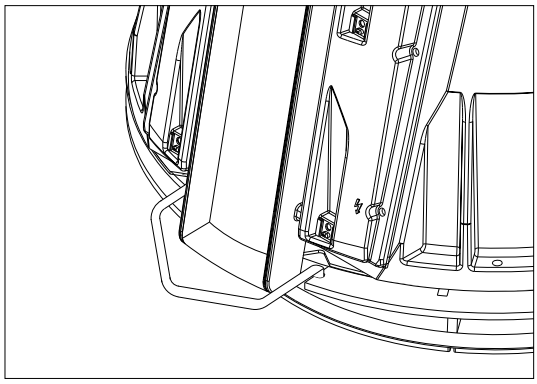

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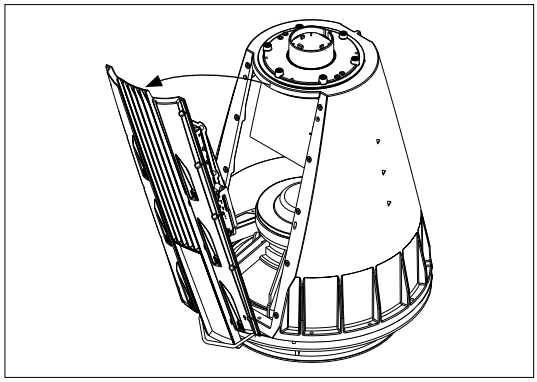
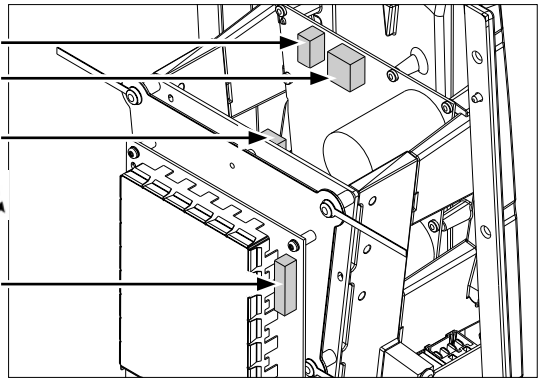


BeoLab 5 Replace main chassis

See page 6.1, Remove cloth frame

See page 6.2, BeoLab 5 in service position

➢4



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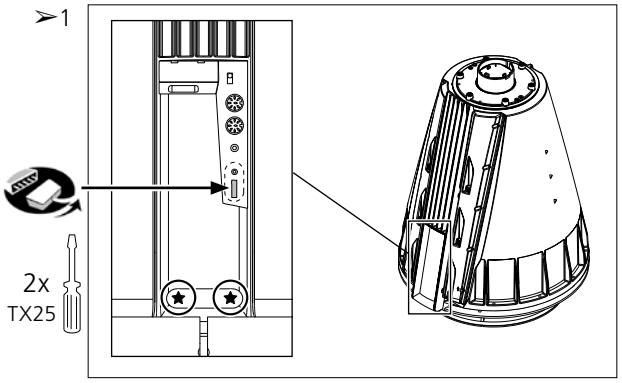

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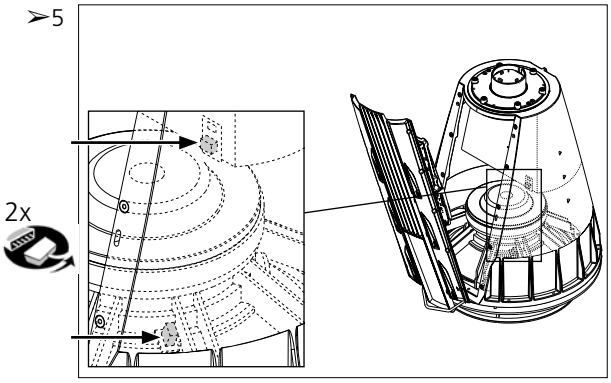

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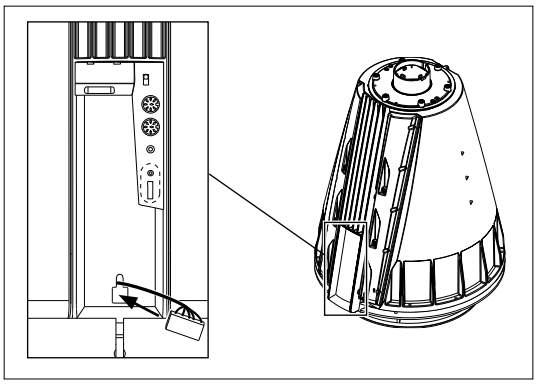
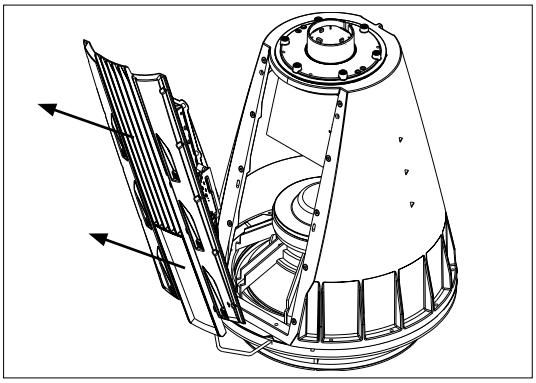


➢6



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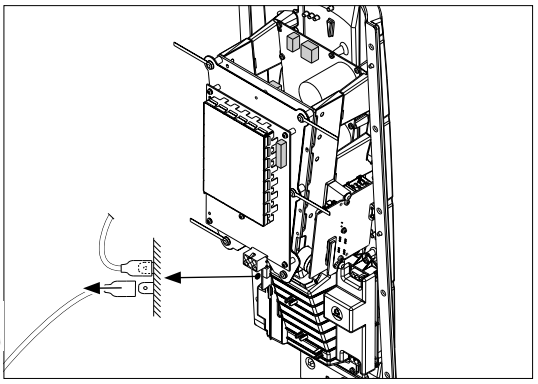
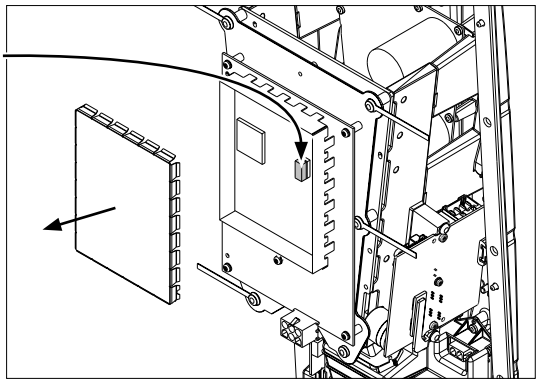


Mounting new main chassis

Mounting new main chassis

➢7
IC304

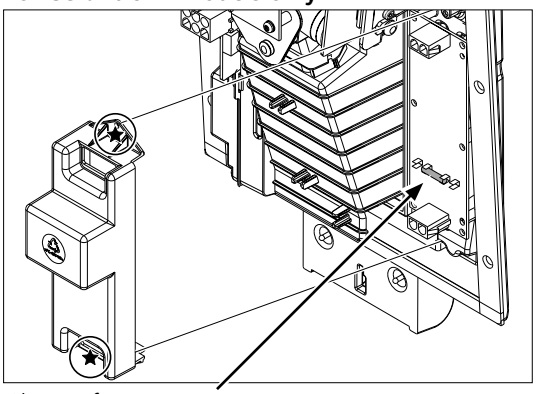


Replace using IC-pliers (part no. 3629145)

For US and JPN models only

➢8

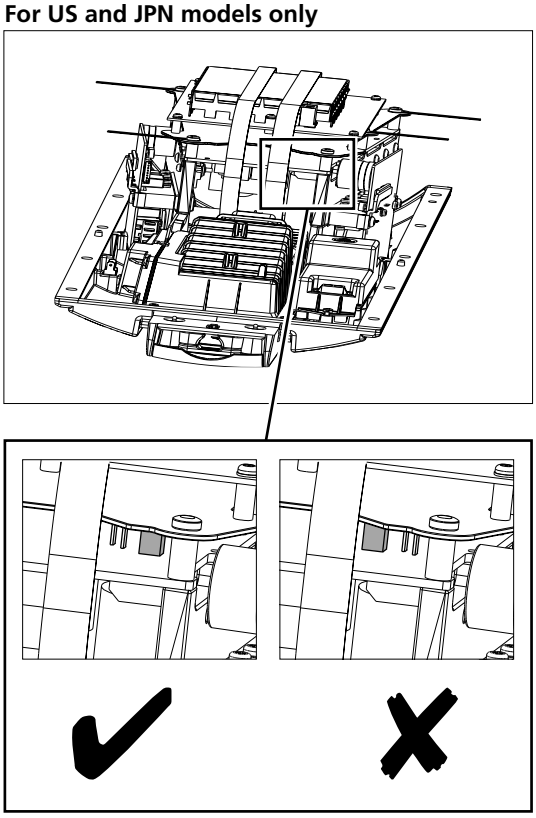
2x
TX10



Change fuse to T10A

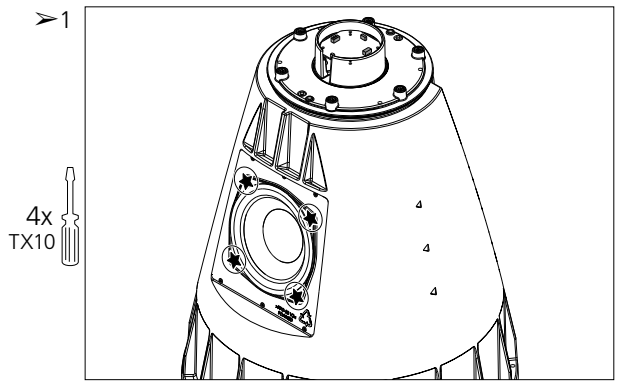
For US and JPN models only

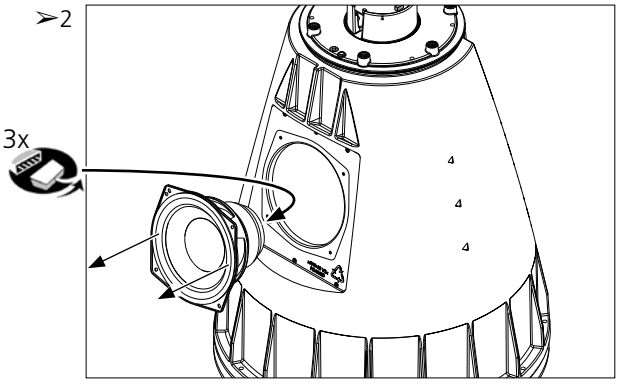
➢9



Replace woofer 165mm, 6½"

See page 6.1, Remove cloth frame





Replace woofer 381mm, 15"

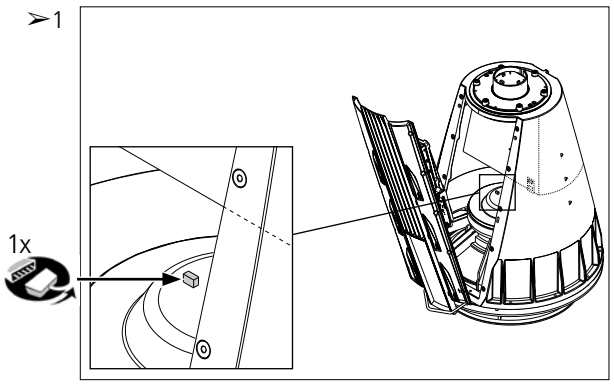
See page 6.1, Remove cloth frame

See page 6.2, BeoLab 5 in service position

See page 6.3, Remove main chassis, ➢1 - 5

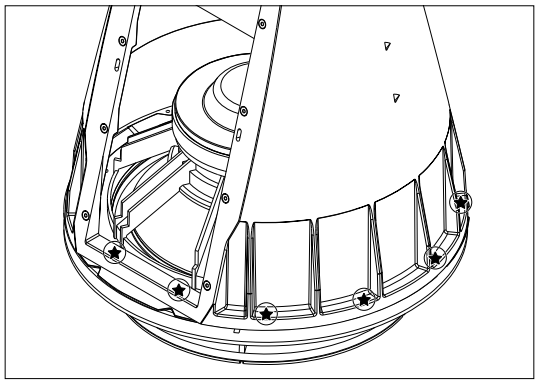
➢1

1x

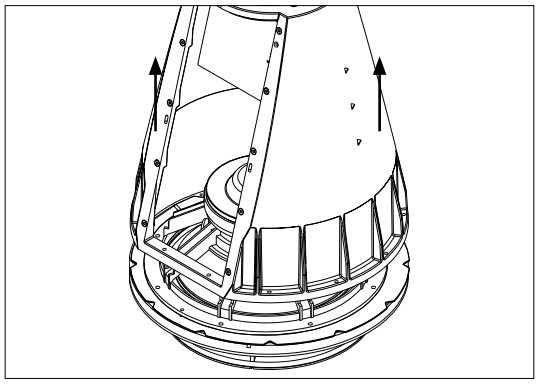


➢2

12x
TX25

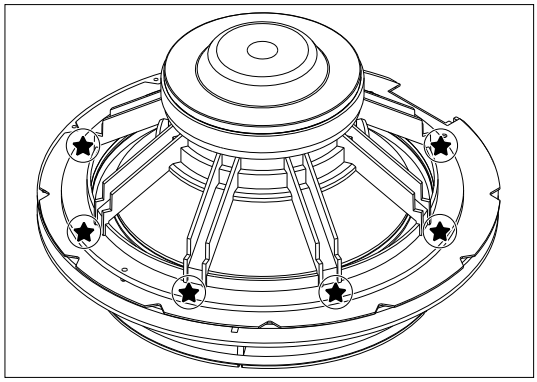


➢3

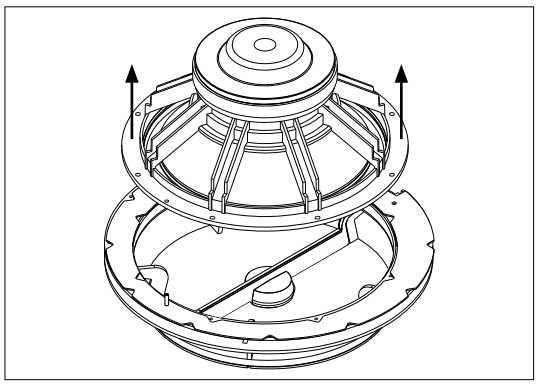


➢4

8x
TX25



➢5



Replace foot

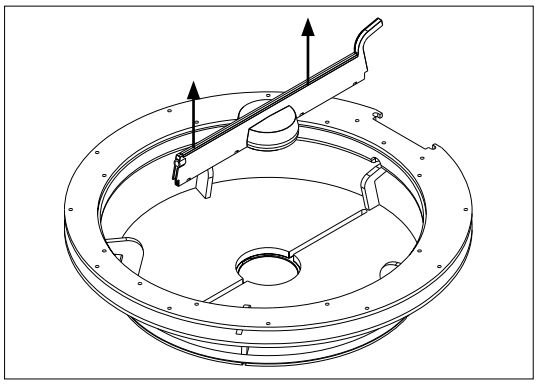
See page 6.1, Remove cloth frame

See page 6.2, BeoLab 5 in service position

See page 6.3, Remove main chassis, ➢1 - 5

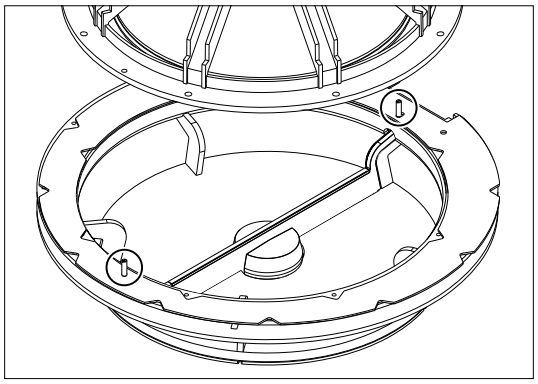
See page 6.6, Remove woofer 381mm, 15"

➢4

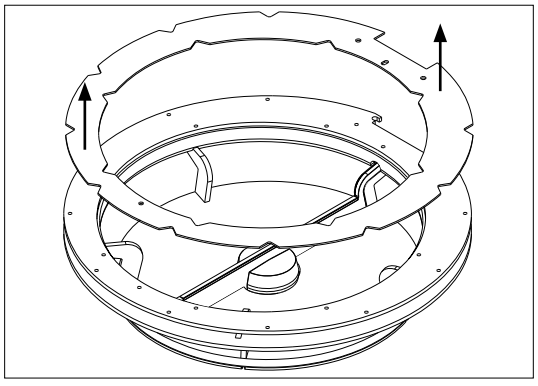


➢1

2x

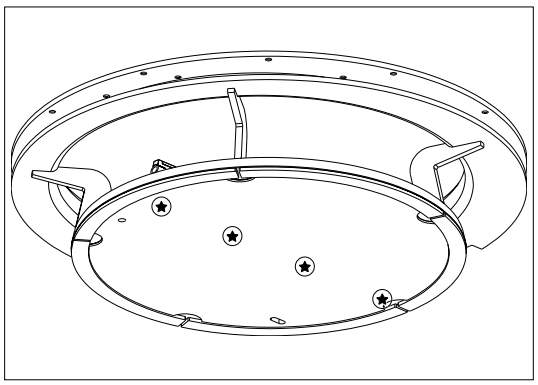


➢2



➢3

4x
TX10

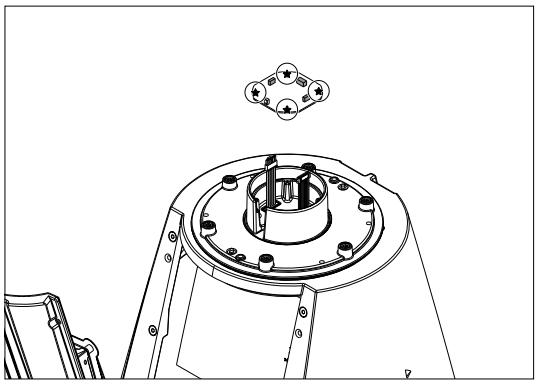


Replace transformer

See page 6.1, Remove cloth frame

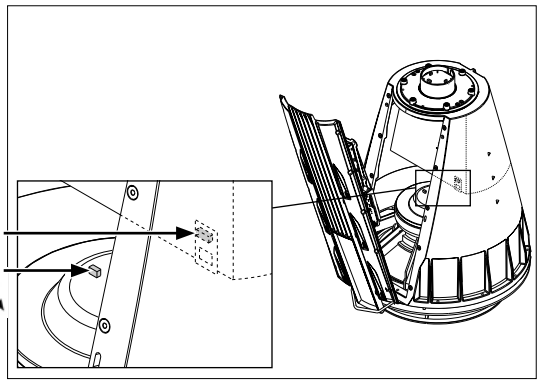
See page 6.2, BeoLab 5 in service position

➢4

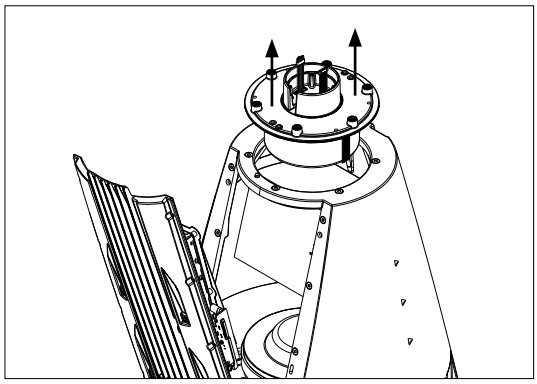


➢1

2x

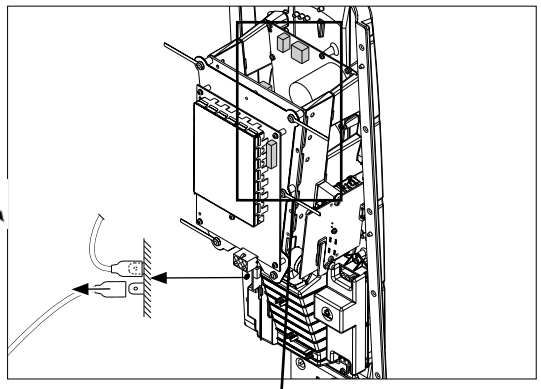


➢5



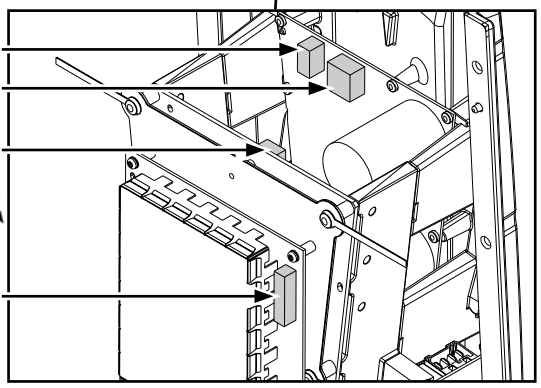
➢2

1x



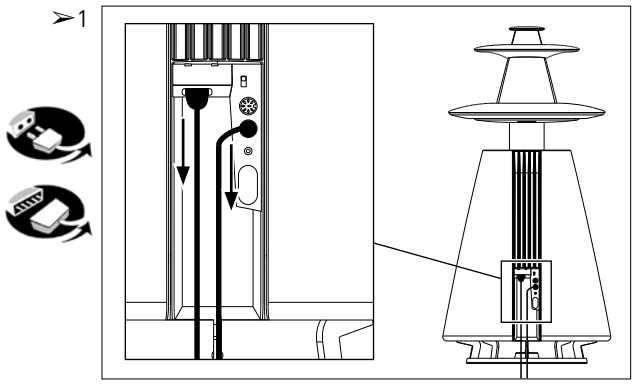
➢3

4x

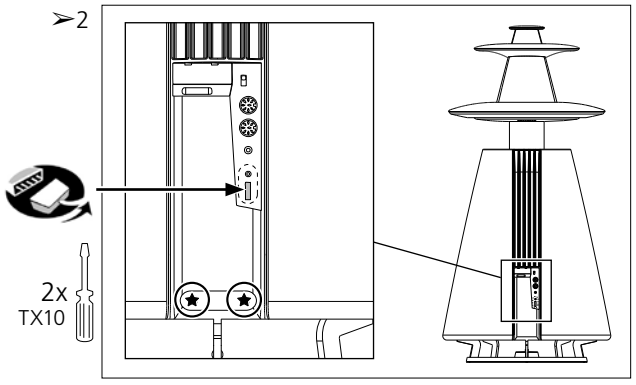


Replace microphone

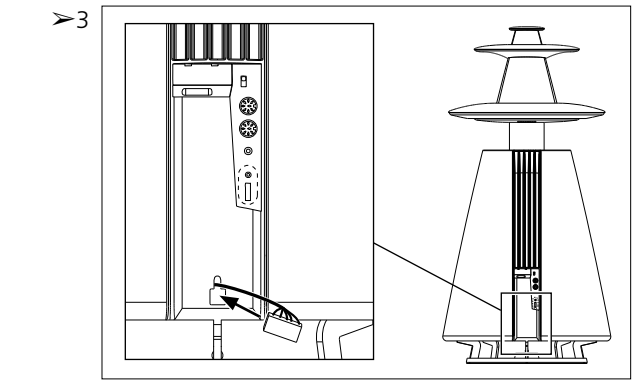
➢1



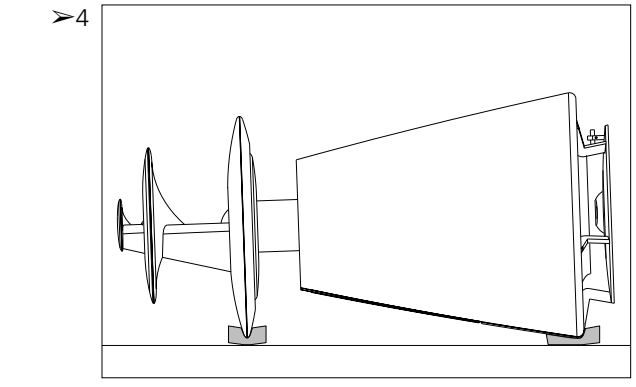
➢2



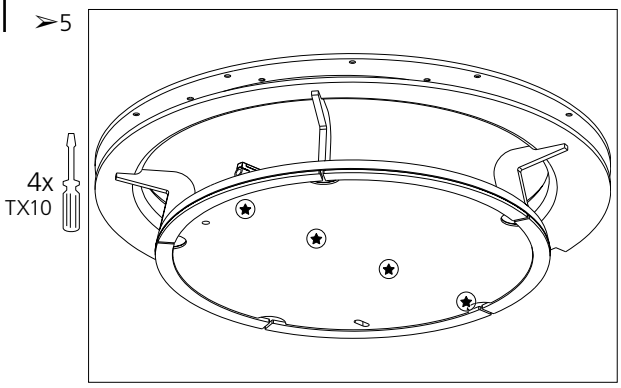
➢3



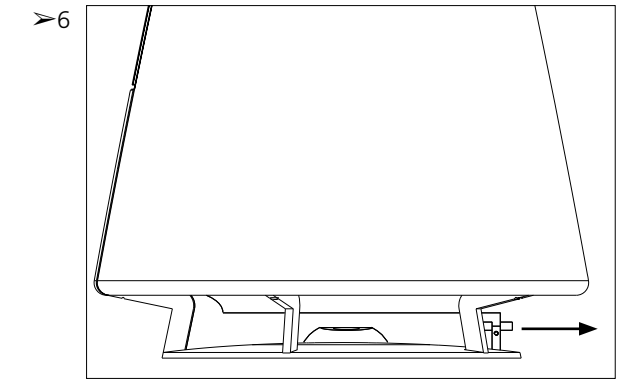
➢4



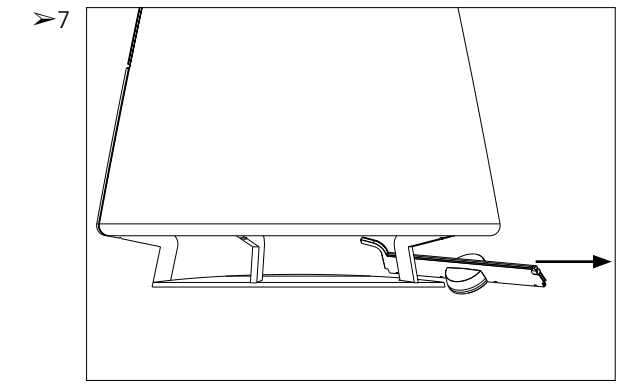
➢5



➢6



➢7



Replace loudspeaker cabinet

→ See page 6.1, Remove cloth frame

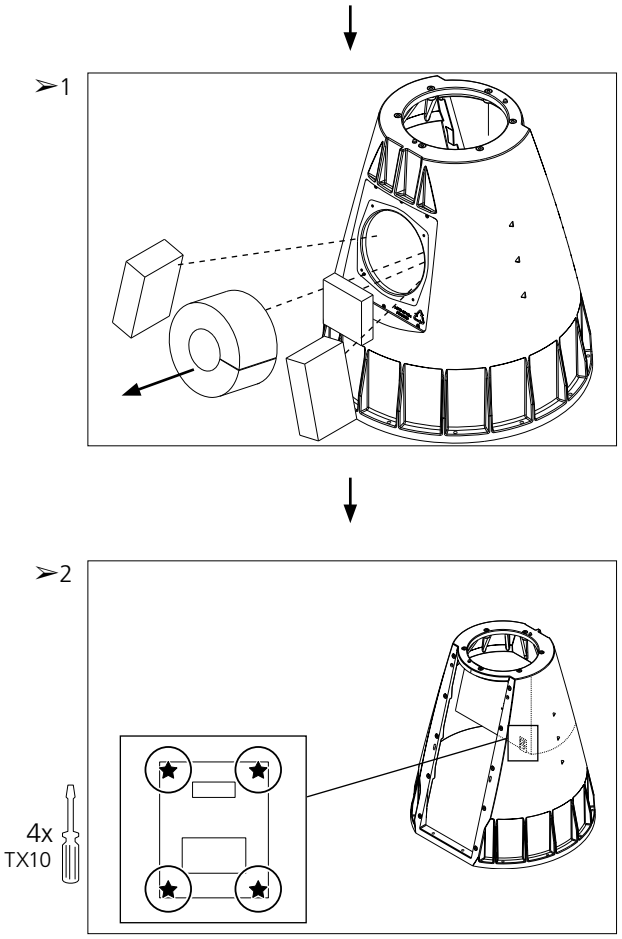
→ See page 6.2, BeoLab 5 in service position

→ See page 6.3, Remove main chassis, ➢1 - 5

→ See page 6.5, Remove woofer 165mm, 6½"

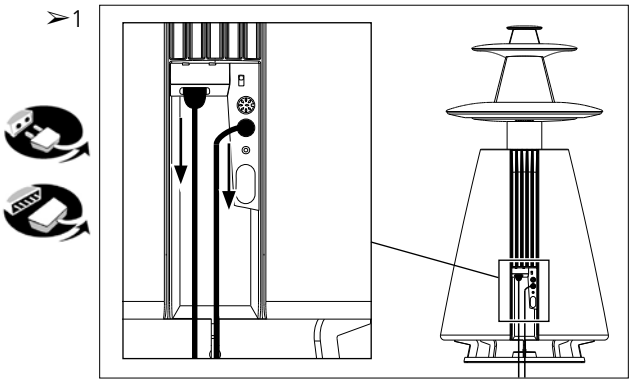
→ See page 6.8, Remove transformer

→ See page 6.6, Remove woofer 381mm, 15", ➢1 - 3

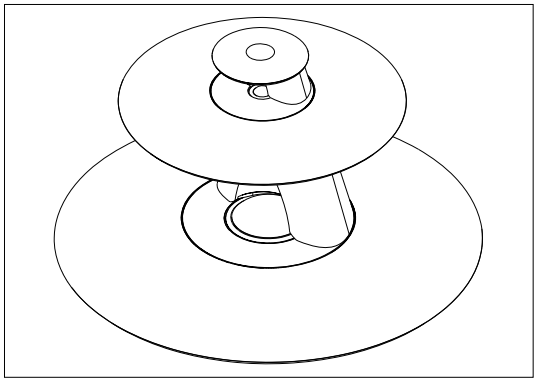


Replace topplate

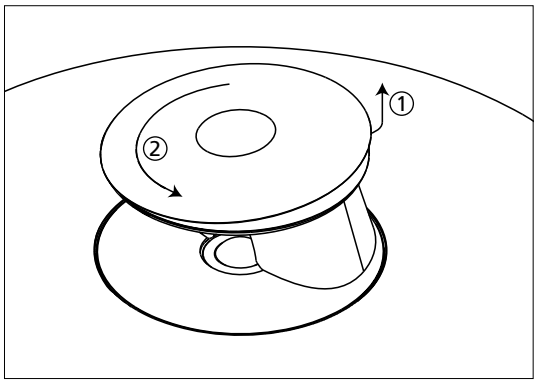
➢1



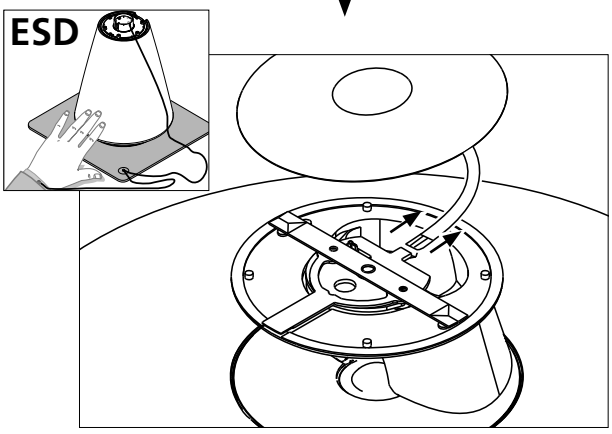
➢2



➢3

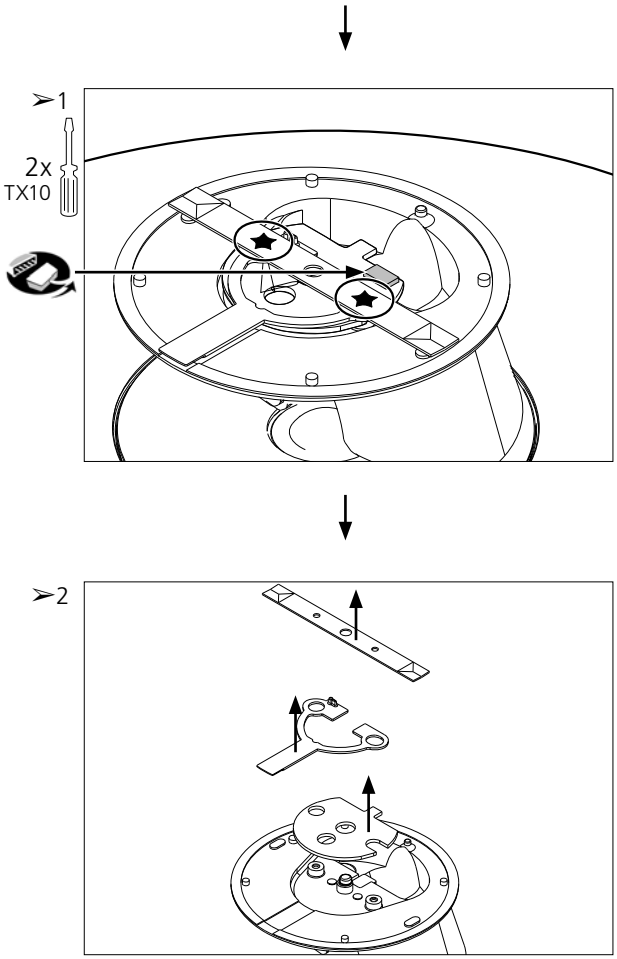


➢4



Dismantling lens for tweeter

See page 6.11, Remove topplate

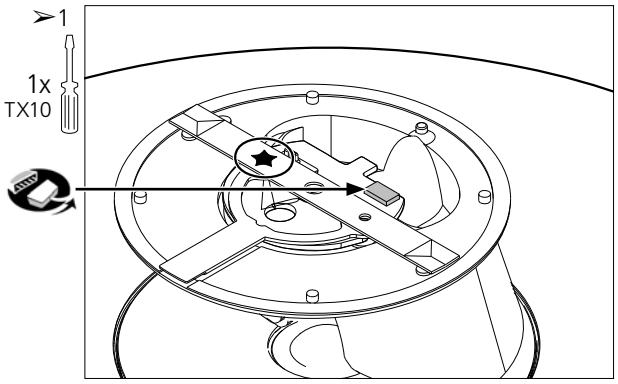


Replace tweeter 19mm, ¾"

See page 6.11, Remove topplate

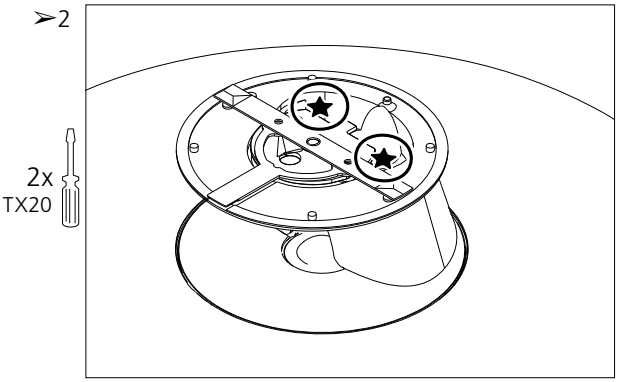
➢1

1x
TX10

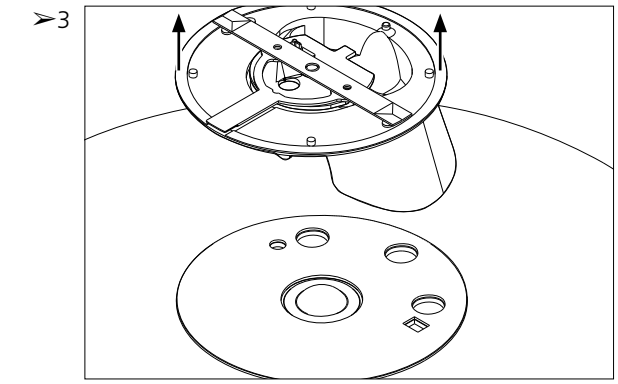


➢2

2x
TX20

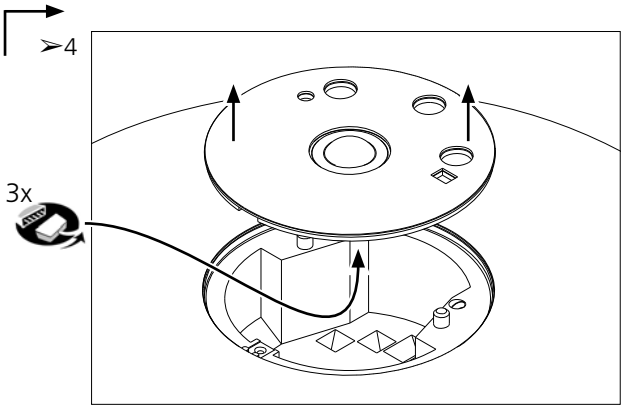


➢3



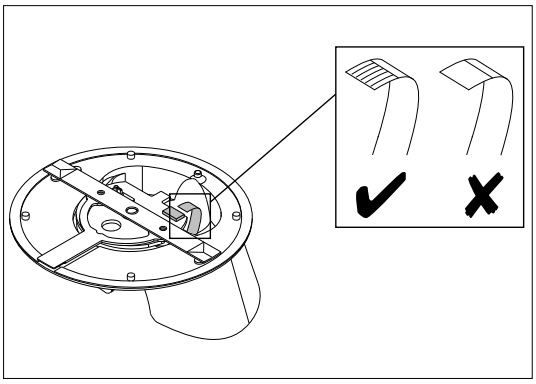
➢4

3x



Remount tweeter 19mm, ¾"

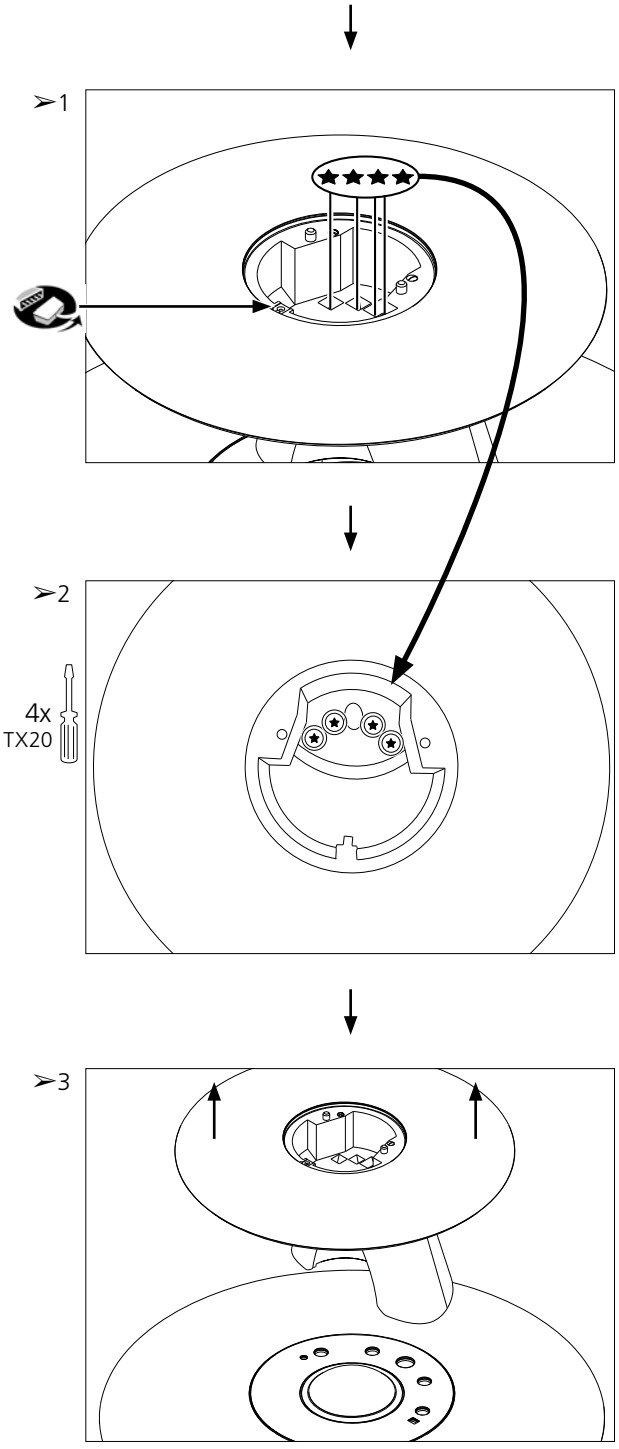
➢5



Replace aluminiumplate for tweeter

See page 6.11, Remove topplate

See page 6.12, Remove tweeter, ➢1 - 4

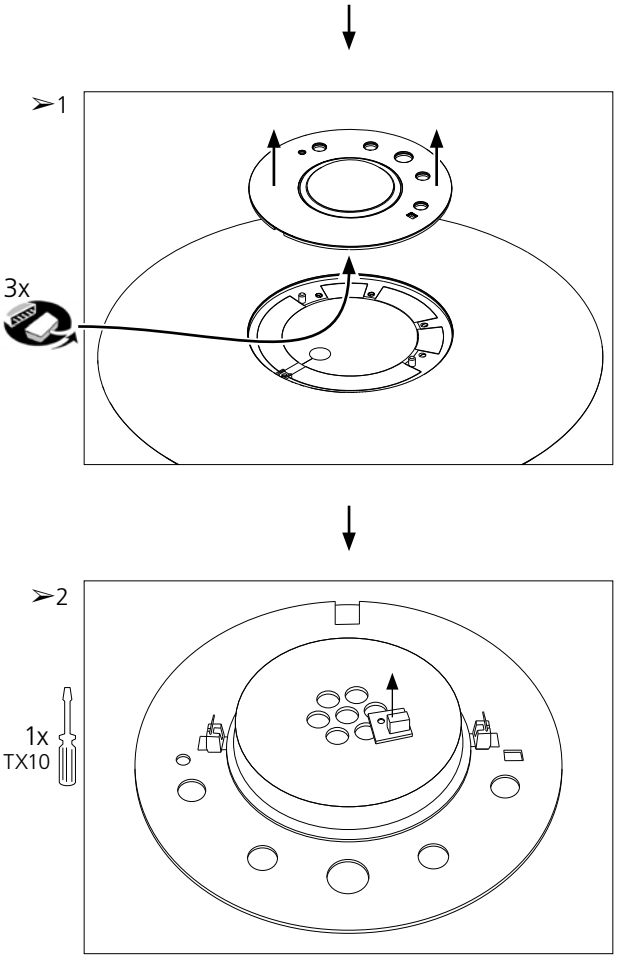


Replace midrange 76mm, 3"

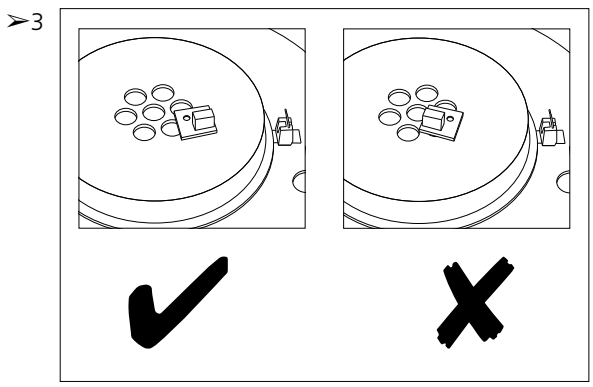
→ See page 6.11, Remove topplate

→ See page 6.12, Remove tweeter, ➢1 - 4

→ See page 6.13, Remove aluminiumplate for tweeter



Remounting midrange 76mm, 3"



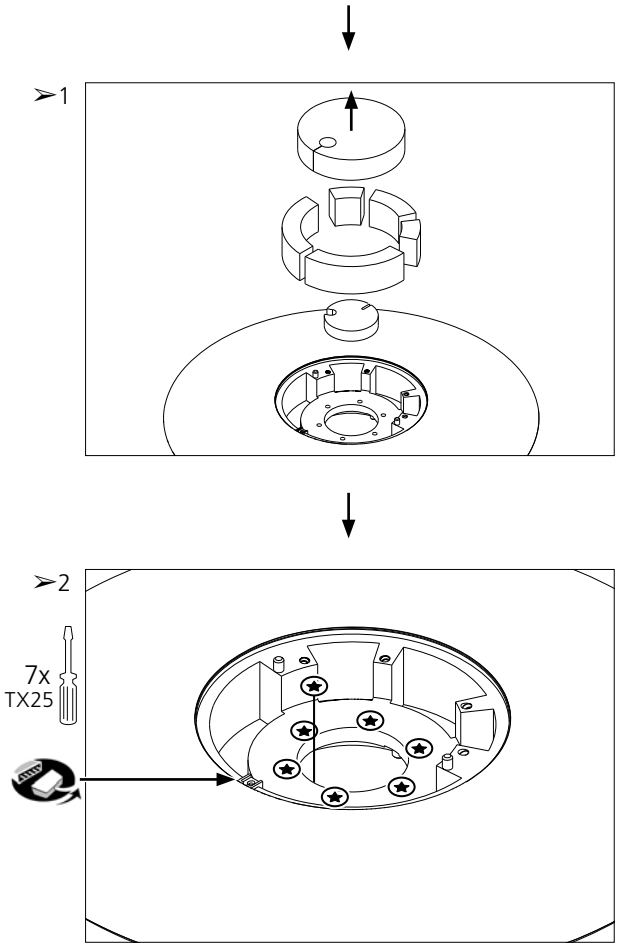
Replace aluminiumplate for midrange

See page 6.11, Remove topplate

See page 6.12, Remove tweeter, ➢1 - 4

See page 6.13, Remove aluminiumplate for tweeter

See page 6.14, Remove midrange, ➢1 - 2



Replace topcover

See page 6.10, Remove topplate

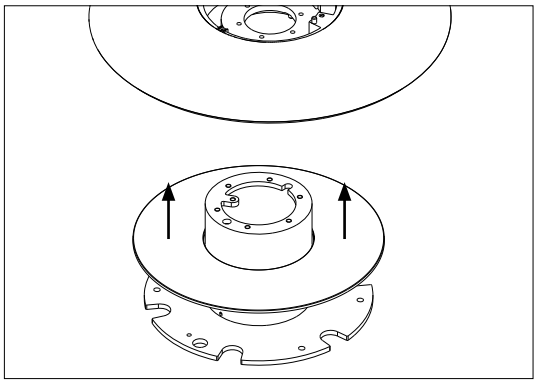
See page 6.11, Remove tweeter, ➢1 - 4

See page 6.12, Remove aluminiumplate for tweeter

See page 6.13, Remove midrange, ➢1 - 2

See page 6.14, Remove aluminiumplate for midrange

➢1



Insulation test

BeoLab 5 must be insulation tested if it has been dismantled.
Make the test when the BeoLab 5 is reassembled and is ready to be returned to the customer.

Insulation test at the Service center

Short-circuit the two pins of the mains plug and connect them to one of the terminals of the Insulation tester. Connect the other terminal of the insulation tester to ground on the Power Link socket.
To avoid damaging the BeoLab 5, it is essential to ensure that both terminals of the insulation tester have good contact.
Slowly turn up the voltage control of the insulation tester until a voltage of 2.5kV(ac) is obtained.
Maintain that voltage level for one second, then slowly turn it down again.
During the testing the current must not exceed 5mA.

Insulation test at the customer

Remove the mains cable from the wall outlet.
Place a jumper across the two AC plug prongs.
Use a multi-meter, set for measurements in the Ohm-area.
Place one lead from the multi-meter on the AC plug and place the other lead on ground at the Power Link plug.
The resistance during this measurement must be of 1 Mega Ohm or more.
Resistance measured below 1 Mega Ohm indicates an abnormal situation and corrective action must be taken.

Please note:

Avoid all skin contact with the AC plug and all other metal parts while performing the test, as this contact may influence the measurement.

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